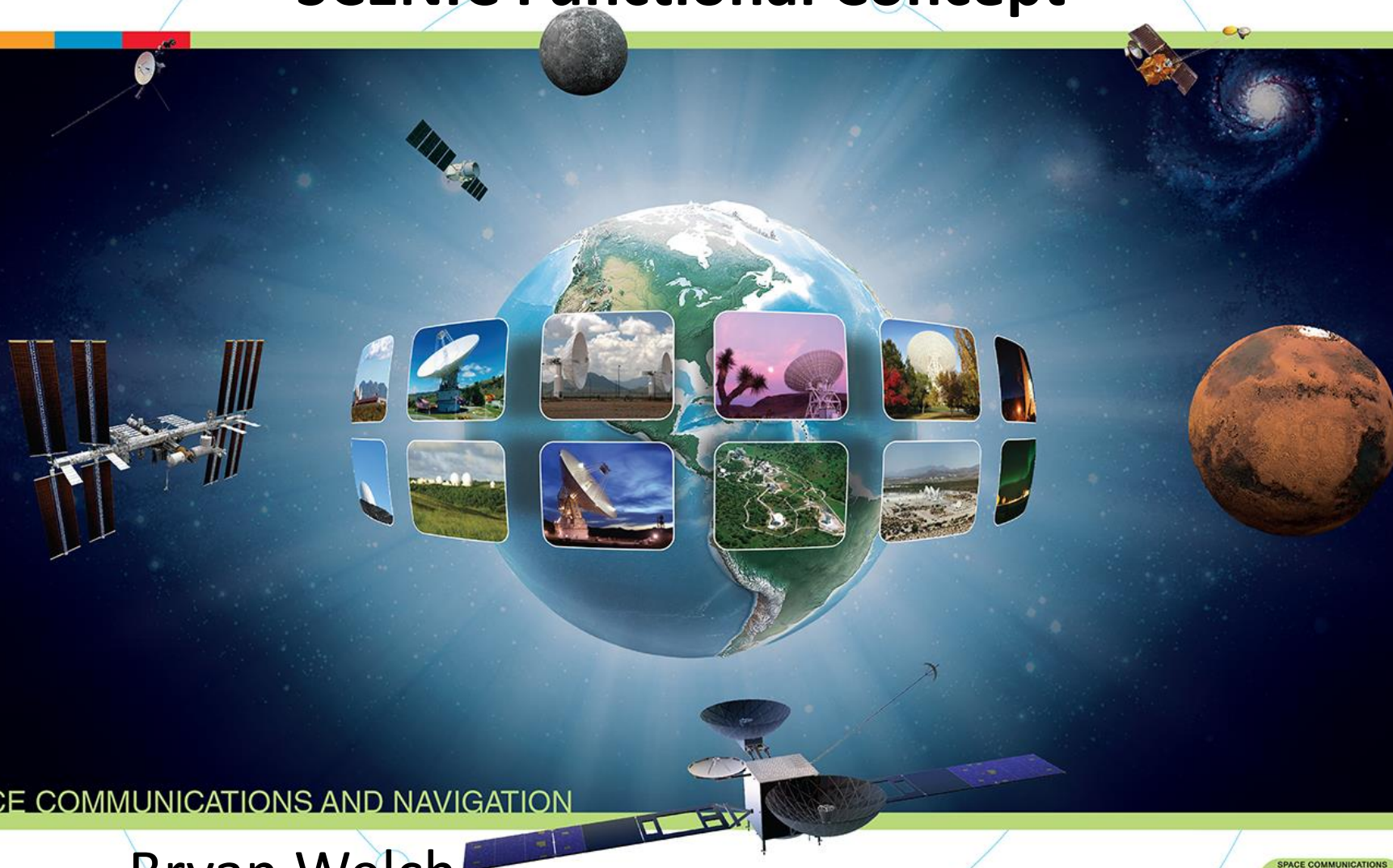


STAT Overview & SCENIC Functional Concept

National Aeronautics and
Space Administration



SPACE COMMUNICATIONS AND NAVIGATION

Bryan Welch
May 20, 2016

www.nasa.gov





Expectations of Discussion



- Overview of guiding principles of STAT derivation from back in early 2012
- Functional view of STAT operations
- STAT Demonstration
- Discussion of how functional view of STAT is an excellent model in my perspective of the necessary functional view of the SCENIC Analysis Tool.
- **NOTE: This is not suggesting that STAT is the solution for the SCENIC Analysis Tool.**



What is STAT?



- STAT = SCaN Testbed Analysis Tool
- STAT is a Matlab-based Graphical User Interface that performs link access and RF predictions, visualizations, post-processing, and analysis
- STAT uses Matlab as the data transportation service to send data to STK, control STK, and return data from STK
- STAT uses Matlab as the analysis engine to perform processing/calculations needed per the user request or as an input to STK parameters
- STAT uses STK's 2D and 3D graphical illustrations to provide scenario visualizations to the user
- STAT is expandable to add new capabilities, with V1.67 to be released the week of May 23, 2016



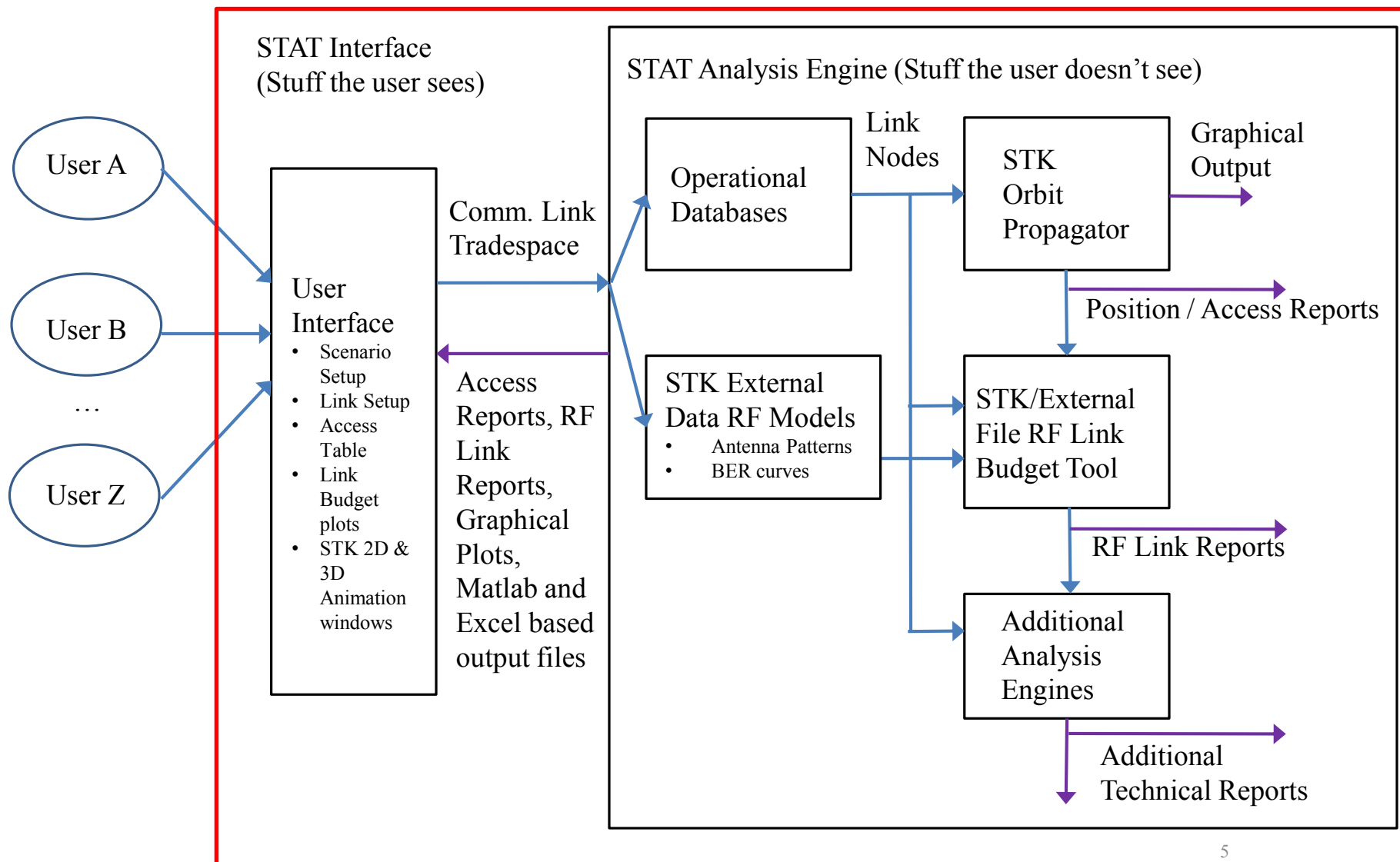
STAT High-Level Design Principles



- User-friendly interface
 - Doesn't require expert knowledge of STK or Matlab functionality
- User-selectable operating modes
 - Different operating modes to enable different functionality
 - Independent treatment of communication and navigation links
 - Independent treatment of access calculation from RF link budget calculation
 - Specific post-processing modes to enable derivation of as-run comparisons to event truth performance model versus nominal prediction/planning usage
- Database archival of elements
 - Spacecraft TLE
 - Spacecraft asset identification to spacecraft asset location
 - RF waveform parameter database
- Scenario/Data User-Configuration
 - Waveform number
 - Waveform classification
 - User-defined
- Scenario/Data Visualization
 - STK Graphical animation (2D & 3D) capabilities
 - Access Table of event timeframes
 - Visualization of dynamic link performance of user-selectable parameters
- Repeatability/Consistency
 - Consistent performance data for consistent input setup configuration
 - Consistent output reporting methodology, independent of the number of links/events analyzed
- Expandable
 - New spacecraft (TDRS 11, 12, 13, GPS, Galileo launches)
 - New modulation/coding schemes (DVB-S2 technologies)
 - New analysis types (GRC-GS automation, Energy Maximized gimbal pointing)

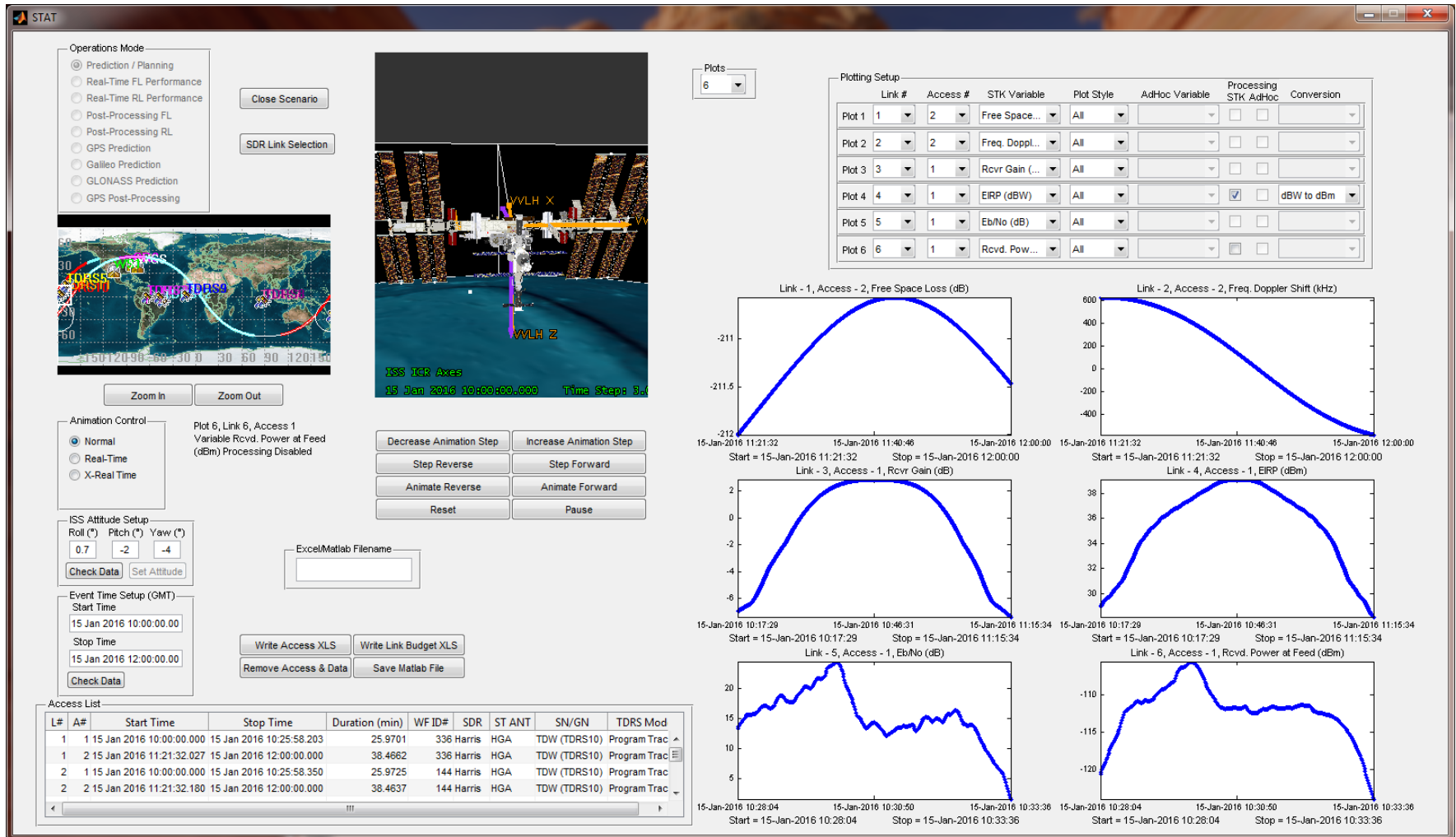


STAT Functional View



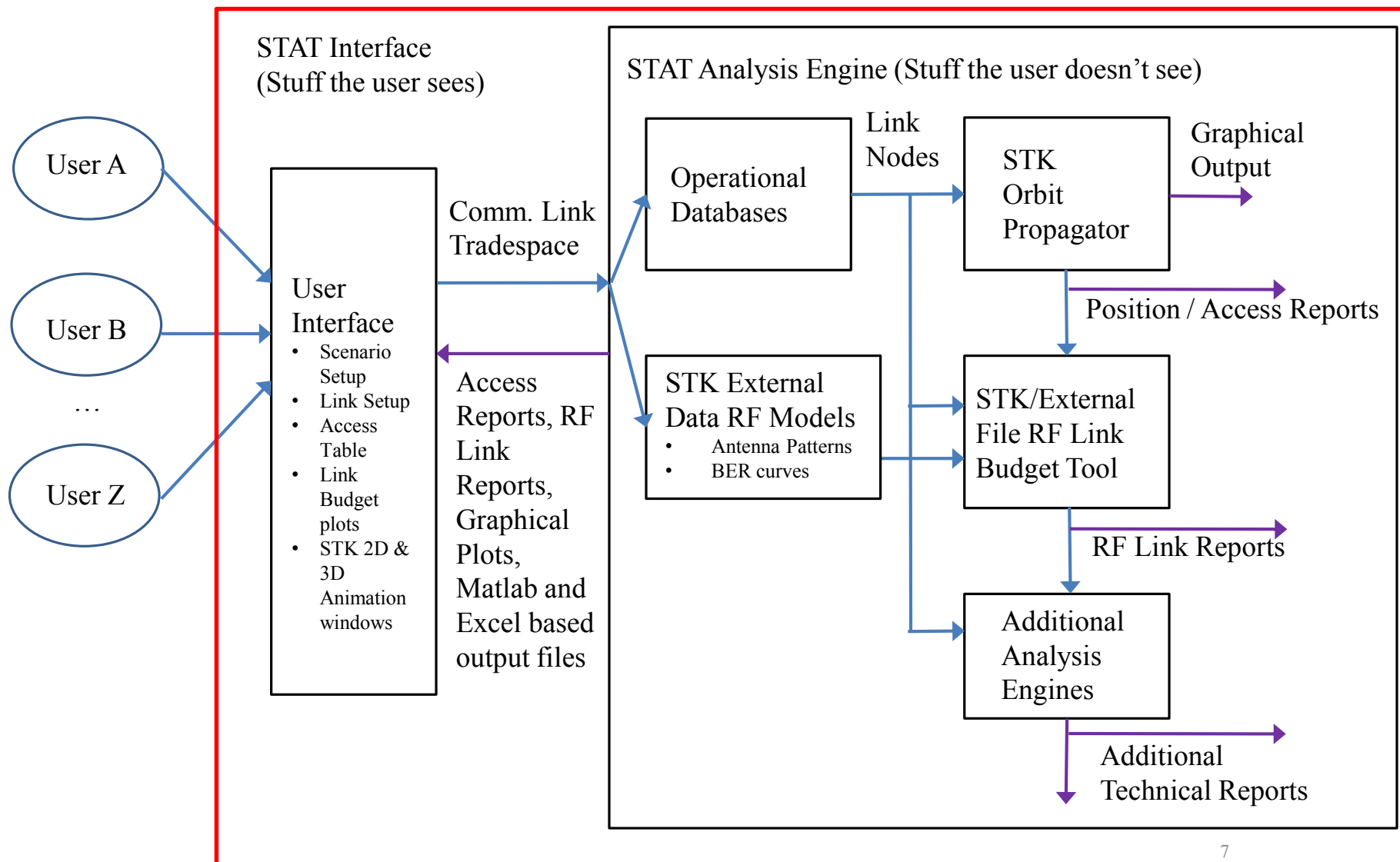


STAT Main Graphic



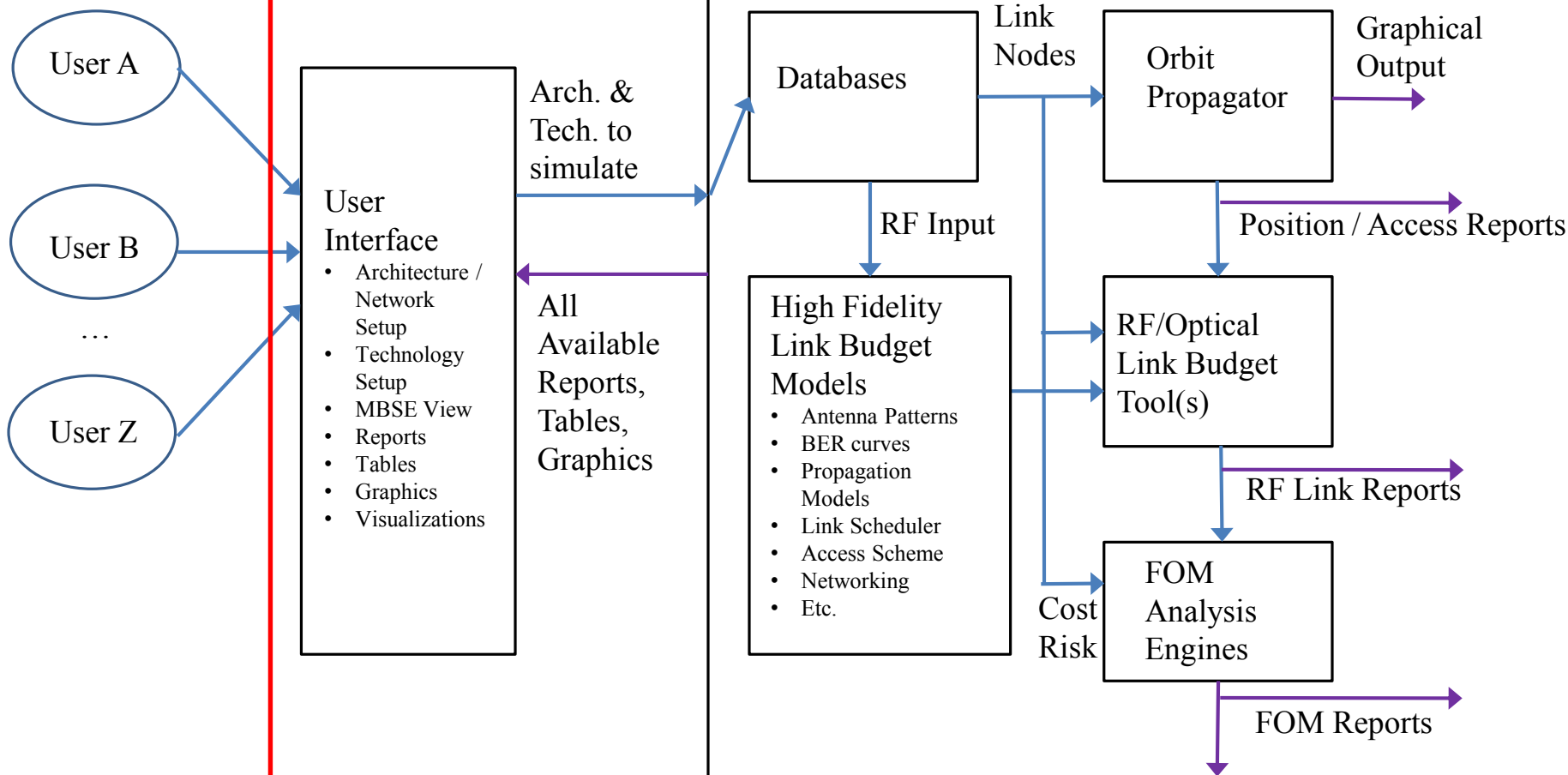
[Go to Demonstration Here](#)

STAT Functional View (again)





Potential SCENIC Analysis Tool Functional View





QUESTIONS?